

2. ~~[Lift and strike welding process according to claim 1, wherein]~~ The process claimed in Claim 1 wherein:

a. setting the first voltage ~~[is set, in terms of its magnitude,]~~ higher than a subsequent second voltage of reverse polarity.

3. ~~[Lift and strike welding process according to claim 1 or 2,]~~ The process claimed in Claim 2 wherein:

a. adjusting the first voltage ~~[is adjusted with]~~ to a positive polarity.

4. ~~[Lift and strike welding process according to one of claims 1 to 3,]~~ The process claimed in Claim 3 wherein:

a. [the element is welded onto the component after the component has previously been covered with a coating, in particular] coating the stud (4) with a lubricant layer for a cold-forming machining operation ~~[, preferably a deep drawing machining operation]~~ prior to welding the stud (4) onto the surface (5).

5. ~~[Lift and strike welding process according to one of claims 1 to 4,]~~ The process claimed in Claim 4 wherein:

a. [after a drop of the first voltage a polarity of] reducing the first voltage to [changes in] a zero-current state ~~[,]~~;

b. using a pilot voltage of a different polarity at the start of the [a] welding process;
and

c. [using preferably a pilot voltage and] subsequently raising the [welding] voltage [then ensues, wherein both voltages have a different polarity to the first voltage] to a welding voltage thereafter.

6. ~~[Lift and strike welding process according to one of claims 1 to 5,]~~ The process claimed in Claim 5 wherein:

- a. ~~[upon attainment of a passage through zero of the first voltage a]~~ maintaining the zero voltage [is maintained] for a predetermined period of time, [after which] a second voltage is [built] building up and applying the second welding voltage.

7. ~~[Second lift and strike welding process, in particular according to one of claims 1 to 6,]~~ The process claimed in Claim 6 wherein:

- a. an electric cleaning current flows between a surface (5) of [a] the component and [an element to be] the stud (4) welded thereon[;] with the stud (4) resting [in that the component rests] on the surface (5); [and then the element] lifting the stud (4) [is lifted] off the surface (5) up to an approximately[; in terms of time,] constant distance for removing a coating from the surface (5) through ignition of an arc as a cleaning agent[;]
- b. changing the polarity of [then] the current [changes its polarity], wherein afterwards at least one welding current is produced; and
- c. [then the element] welding the stud (4) [is welded] to the surface (5).

8. ~~[Lift and strike welding process according to one of claims 1 to 7,]~~ The process claimed in Claim 7 wherein:

- a. using a [the] cleaning current [assumes a current intensity] of between 15 amperes and 500 amperes [before it drops.]; and
- b. reducing the cleaning current after the cleaning operation.

9. ~~[Lift and strike welding process according to claim 7 or 8,]~~ The process claimed in Claim 8 wherein:

- a.** ~~[after a reversal of the polarity an, in terms of magnitude,]~~ reversing the polarity of the current; and
- b.** applying a maximum welding current ~~[is produced]~~ to weld the stud (4) to the surface (5).

10. ~~[Lift and strike welding process according to one of claims 1 to 9,]~~ The process claimed in Claim 9 wherein:

- a.** moving the stud (4) ~~[the element (4) is brought back]~~ into contact with the surface (5) ~~[only]~~ after disconnection of the welding current.

11. ~~[Lift and strike welding process according to one of claims 1 to 10,]~~ The process claimed in Claim 10 wherein:

- a.** applying the cleaning current ~~[lasts]~~ as long as or longer than ~~[a]~~ the pilot current, which ~~[flows]~~ is applied prior to applying the welding current ~~[and/or the welding current].~~

12. ~~[Lift and strike welding process according to one of claims 1 to 11,]~~ The process claimed in Claim 11 wherein:

- a.** applying a ~~[the]~~ welding current that is equal to or stronger than the cleaning current.

13. ~~[Lift and strike welding process according to one of claims 1 to 12,]~~ The process claimed in Claim 12 wherein: ~~[the element (4) during cleaning of the surface (5) assumes a distance (S) from the surface (5) which is at least two times greater than the distance (S) from the surface (5) during welding, in particular when a pilot current flows prior to the welding current.]~~

a. raising the stud (4) to a predetermined distance (S) for cleaning which is at least two times greater than the distance (S) for welding that the stud (4) is raised above the surface (5).

14. ~~[Lift and strike welding process according to one of claims 1 to 13,]~~ The process claimed in Claim 13 wherein: ~~[through the measurement of a parameter a duration of the cleaning step is regulated or controlled.]~~

a. controlling the time period of the cleaning process by measuring the current at the surface (5).

15. A lift-and-strike welding apparatus (1) having a guide (9) for a weld-on [element] stud (4) and a control device (10) [or regulator] for the guide (9) [as well as] and a programmed device (11) for controlling or regulating the electric current and [or] the voltage used for welding, [wherein] the lift-and-strike welding apparatus (1) [comprises] comprising:

a. a polarity reversing means (12) for the voltage used for welding [characterised in that] included in the programmed device (11) [for controlling or regulating the electric current and/or the voltage used for welding is programmed or operated in such a way as to produce, prior to the welding operation,] to provide a cleaning current which has a reverse polarity compared to the welding current that is produced prior to the welding operation.

~~[16. — Lift and strike welding apparatus (1) according to claim 15, characterised in that said apparatus is designed for implementing a process according to claims 1 to 14.]~~

~~[17] 16. [Lift and strike welding apparatus (1) according to one of claims 5 or 16, characterised in that said apparatus comprises]~~ The combination claimed in Claim 15 wherein:

a. the programmed device (11) has a focusing device [for] to produce an arc which is to be struck.

~~[18]17.~~~~[Lift and strike welding apparatus (1) according to one of claims 15 to 17, characterised in that the]~~ The combination claimed in Claim 16 wherein:

a. the programmed device (11) has a polarity reversing means (12) [comprises] to produce a shorted circuit for maintaining [a] the struck arc during a reversal of the polarity.

~~[19]18.~~~~[Lift and strike welding apparatus (1) according to one of claims 15 to 18, characterised in that said apparatus comprises]~~ The combination claimed in Claim 17 wherein:

a. the welding apparatus (1) has an evaluation device[, particularly for quality inspection, for at least one parameter at least of] that operates during the cleaning operation to inspect the quality of the cleaning.

~~[20]19.~~~~[Polarity reversing means (12) for a lift and strike welding apparatus in particular according to one of claims 15 to 19, characterised in that]~~ The combination claimed in Claim 18 wherein:

a. the polarity reversing means (12) [comprises] has a circuit element[7];

b. [which] the circuit element produces an arc current [in order to] maintains [a] the struck arc during [a] the reversal of a polarity of the arc voltage.

~~[21]20.~~~~[Polarity reversing means (12) according to claim 20, characterised in that]~~ The combination claimed in Claim 19 wherein:

a. [the polarity reversing means (12) comprises] a first (13) [and a second (14)] power source[7] formed in the polarity reversing means (12) wherein the first power source (13) [supplies] to supply a cleaning current to the welding apparatus (1); and

b. ~~[the] a~~ second power source (14) formed in the polarity reversing means (12)
[supplies] to supply a pilot current and~~[/or]~~ a welding current to the welding
apparatus (1).

~~[22]21.[Polarity reversing means (12) according to claim 20 or 21, characterised in that]~~ The
combination claimed in Claim 20 wherein:

a. a coil (15) is connected to the second power source (14) ~~[in such a way that a]~~ to
maintain the struck arc ~~[continues to be maintained]~~ during ~~[a]~~ the reversal of the polarity.

~~[23]22.[Aluminum surface with welded on element (4), wherein the aluminum]~~ The
combination claimed in Claim 15 wherein:

a. the surface (5) is formed of aluminum;

b. the surface (5) has ~~[or has had]~~ a lubricant coating (8) ~~[, in particular a lubricant~~
~~layer,]~~ formed thereon during its manufacture ~~[d using a process according to~~
~~one of claims 1 to 14].~~

~~[24]23.[Steel sheet with welded on element, wherein the steel sheet surface has or has had a~~
~~coating, in particular a lubricant layer or a zinc layer, manufactured using a process according~~
~~to claims 1 to 14.]~~ The combination claimed in Claim 15 wherein:

a. the surface (5) is formed of steel sheet; and

b. the surface (5) has a lubricant coating formed thereon during its manufacture.

REMARKS

The Applicant's Attorney has amended the specification and the claims to place the case in keeping with the United States patent practice. For convenience, **a clean version of the amended claims is attached hereto as Attachment I.**